

JOURNAL OF CALENDAR REFORM

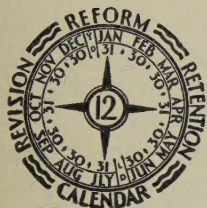
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Published by

THE WORLD CALENDAR ASSOCIATION
International Building, 630 Fifth Avenue
New York City
ELISABETH ACHELIS, *President*



VOL. 6

AUGUST, 1936

No. 2

TIME MEASURES ON MARS

By ROBERT G. AITKEN

Former Director Lick Observatory

How would a man from Mars regard the calendar problems of his brethren on the planet Earth? This is the interesting and imaginative viewpoint from which the distinguished scientist, Dr. Aitken, approaches the subject of calendar reform.

A FEW days ago, while I was reading with special interest the announcement that the American Philosophical Society, like the American Academy of Arts and Sciences, had definitely endorsed the 12-month World Calendar, my friend, the Man from Mars, entered my office and, seeing the *Journal of Calendar Reform* and other papers on my desk, was moved to comment.

He expressed his surprise that the human race which prided itself upon its progressiveness, had so long been content to put up with the present hodge-podge calendar and that it should be so slow and hesitant about adopting the revision proposed by The World Calendar Association, a revision that would so obviously improve and simplify,—particularly since the adoption of the new system could be effected with so little inconvenience to anyone. He readily agreed that any plan of revision, to succeed, must commend itself to the Church as well as to the worlds of business and science. "But," said he, "now that the highest authorities in your great ritual churches, as well as so large a number of great business

organizations and scientific societies have expressed their approval of the 12-month World Calendar, I find it difficult to understand the reasons for further delay."

I tried to explain to him the power of tradition and the reluctance of the conservative element to give up an old custom or tradition in favor of a new one, even though the new one offered definite advantages. But this, he contended, was unreasonable. "It is all right," he said, "to heed the injunction of your great apostle Paul to 'hold fast that which is good,' but the apostle certainly did not and would not advise holding something that is not so good and that can so easily be made better." He wrinkled his oddly shaped brow and paused a moment to consider the matter.

"Of course," he continued, "it would be most convenient if your year contained an exact number of days, and if that number were exactly divisible both by 7 and by 12. But Dame Nature, if she be the responsible party, has been culpably indifferent to commensurability in the rotation periods and revolution periods of the Earth and of all of the other planets. Happily, this is of no consequence except for Mars and the Earth, for as we know, the other planets are uninhabitable, or at any rate uninhabited.

"Think of the tribulations of calendar makers on the planet Jupiter, if there were any! Not only are there about 10,500 Jovian days in the Jovian year, but if the equatorial acceleration in the rotation period, which we observe in the outer layers of its atmosphere, extends down to the layer on which the imaginary Jovians might be supposed to live, the number of days in the year varies with the latitude, and at the equator may be fully 90 greater than in high north and south latitudes." He smiled at the odd picture he had conjured up, and I smiled with him.

"Even with us Martians," he added, "it is bad enough, as you know, for your astronomers have measured the length of our day and of our year accurately in your units of time, just as we have measured the lengths of the Earth's day and year."

It is true that we know the lengths of the Martian day and year in mean solar days very precisely. Mars makes one sidereal rotation in 24 hours 37 minutes 22.58 seconds of mean solar (terrestrial) time, and one complete revolution about the Sun in 686.98 mean solar days. Expressed in units of *Martian* mean solar days, this means that the Martian sidereal year has 669.5999 days, and since on Mars, as on the Earth, sidereal time gains one full day on mean solar time in one revolution, that is, in one year, the Martian *calendar* year will have 668.60 days.

As compared with our 365.2564-day calendar year, this fractional number apparently has disadvantages but also advantages. I questioned my visitor on the subject. "Yes," said he, "the incommensurability raises a problem, and at a very early stage in our history this was fully realized and alternative possible solutions were vigorously debated. We wished, of

course, to keep our year dates in step with our seasons; and these, as you know, closely parallel your own, since the inclination of our equator to the plane of our orbit ($25^{\circ} 10'$) is but little greater than the inclination of the terrestrial equator ($23^{\circ} 26' 59''$) to the plane of the ecliptic.

"Three schemes were considered. We might have four years of 669 days each, followed by one of but 667 days, or four years of 668 days each, followed by one with 671 days. By either plan we should have 3343 days in five years—what the actual rotation and revolution periods require.

"It was agreed, however, after full debate, that these plans were far inferior to the plan of having our years run alternately 668 and 669 days, and then inserting an extra leap-day every tenth year to care for the odd one-tenth of a day. We adopted this arrangement, which will keep our year dates in step with the seasons for more than 10,000 years.

"We divide our year into quarters, as you do, but make it begin with the date of the Vernal Equinox, and we insert the intercalary day required in the decennial years at midyear, between the second and third quarters, calling it *Mid-Year Day* and celebrating it as a holiday.

"Our years, then, run as follows:

	<i>Spring</i>	<i>Summer</i>	<i>Autumn</i>	<i>Winter</i>	
Days in Odd Years	167	167	167	167	= 668
Days in Even Years	167	167	167	168	= 669
Days in Decennial Years	167	167 (1)	167	168	= 670

"Even before we adopted this calendar we had found it desirable to set aside one day in seven as a rest day, such as your Sunday was designed to be. We have nothing on Mars that corresponds exactly to your lunar month, for, as you are aware, we have two satellites or Moons, the outer one of which makes one complete revolution in its orbit in about $1\frac{1}{4}$ of our days, while the inner one revolves nearly four times as fast, so that it actually rises in the west. It was, however, convenient to divide the seasons, or quarter years, into periods of a few weeks each, just as you divide yours into months, and it seemed to our calendar makers logical to continue the quarter system. Our year, therefore, has 16 periods of 42 or 41 days (6 weeks) each; all odd-numbered years begin on a *Sunday*, in your nomenclature, and all even-numbered years on a *Wednesday*. All four quarter periods of Spring in the odd-numbered years also begin on Sunday, those of Summer on Saturday, of Autumn on Friday, and of Winter on Thursday. In the even-numbered years, the quarter periods of Spring, Summer, Autumn and Winter begin, in order, on Wednesday, Tuesday, Monday and Sunday. Since the last quarter of the even-numbered years always has 42 days, the odd-numbered years again begin on a Sunday, and since the intercalary *Mid-Year Day* has no week-day name, this set-up is cyclical, so our calendar is perpetual on a two-year basis.

"Moreover, you will note that the first three quarter-periods of each season in both odd- and even-numbered years all have 36 working days per month (except for specially decreed holidays), and the last quarter-period in each season, 35 with, however, 36 in the last period of winter in *even-numbered years*.

"Here, then, is our Perpetual Calendar:

ODD-NUMBERED YEARS

Seasons	Spring		Summer		Autumn		Winter	
Quarters	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days
1	Sun.	42	Sat.	42	Fri.	42	Thur.	42
2	Sun.	42	Sat.	42	Fri.	42	Thur.	42
3	Sun.	42	Sat.	42	Fri.	42	Thur.	42
4	Sun.	41	Sat.	41	Fri.	41	Thur.	41

EVEN-NUMBERED YEARS

Seasons	Spring		Summer		Autumn		Winter	
Quarters	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days	First Day	No. of Days
1	Wed.	42	Tues.	42	Mon.	42	Sun.	42
2	Wed.	42	Tues.	42	Mon.	42	Sun.	42
3	Wed.	42	Tues.	42	Mon.	42	Sun.	42
4	Wed.	41	Tues.	41	Mon.	41	Sun.	42
Mid-Year Day*								

*Mid-Year Day, a Holiday. Insert in all years whose number is divisible by 10.

"I have used your week-day names instead of our own for your convenience. You can readily see that this calendar, in this form or given in detail for all days in the year so that holidays may be noted, is not at all difficult to master and that it divides the quarters of the four seasons, and the number of working days in each season as evenly as is possible. Any set holiday, like your Christmas for example, will always fall upon the same week-day in odd-numbered years, and likewise in even-numbered years, though the week-day in the odd- and even-numbered years will differ by a fixed number of days."

Just then my visitor glanced at his watch and found that he had barely time to catch the next *Interplanetary Express* (which, incidentally, has as real an existence as my Martian friend himself) and hurried away, leaving me to ponder over the simple Martian calendar and to regret that on our Earth we have not yet been able to secure the adoption of the even simpler and better calendar proposed by The World Calendar Association.

Progress in recent months has been encouraging and it now seems that we may, with some reason, hope to see the 12-month World Calendar adopted in time to put it into actual use on Sunday, January 1, 1939.

RUSSIAN EXPERIMENTS

By THE RIGA CORRESPONDENT OF THE LONDON TIMES

AFTER long periods of experiment and change the calendar of Russia now appears to be stabilized again for the first time since the Bolsheviks formed their Government in 1917. In the present system are several features which distinguish it from the calendars of other countries. The ordinary Soviet year of 365 days is divided into 12 months exactly as before the revolution; but the week has been distorted and reshaped several times. The system is now based on two parallel weeks, one having six, the other seven days. Labour and rest in Soviet towns and industrial regions are regulated by the six-day week. Five days are for work, one day for recreation. The rest days fall on the 6th, 12th, 18th, 24th, and 30th day of each month. March 1 takes the place of the fifth rest day of February, and there is an extra day in the week following the last rest day of the months which have 31 days.

The seven-day week as such is not mentioned in official language, though its existence as a shadow of the past is recognized by the continuance of the same names as were used in Tsarist times to denote the seven days of the week. These pre-revolution day names appear even at the head of *Pravda* and other daily newspapers. The rest day falls on Sunday one week, on Saturday the next, then Friday, and so on.

The parallel week system is aimed particularly at the Church and religion, and here, indeed, the authorities have succeeded in putting their quarry at sixes and sevens in a double sense, for how can a religious worker observe a regular day of worship when his rest day falls on a differently named day each week? The Church might come into line by adopting a six-day week, too, but such a step would be interpreted as counter-revolution.

The number of extra all-day holidays in Russia has now been fixed at five. They were much more numerous before the revolution and during the first 10 years of the Bolshevik régime, but they have been sacrificed ruthlessly to the exigencies of the industrialization plans. The first of these Red Bank Holidays is on January 22 and is known as Lenin's Day, though Lenin died on January 21. Formerly both days (January 21 and 22) were celebrated by a cessation of work at factories, as January 22 was the anniversary of the Father Gapon demonstration in 1905, when the police fired on the crowd outside the Winter Palace at St. Petersburg. Now the two festivals have been run into one. Curiously enough, Lenin's birthday on April 22 is not observed as a full holiday. The next general holiday is May Day, celebrated on May 1 and 2. The first day is set apart for

demonstrations, the second is a day of rest and recreation. November 7 and 8 are similarly used to celebrate the anniversary of the Bolshevik revolution, called the "October Revolution" as the date was October 25 by the Old Style or Julian Calendar then in use.

Besides the five Bolshevik Bank Holidays, there are 10 or 12 days which are still celebrated, though work is not stopped for this purpose. Three of them fall on the ordinary rest days of the six-day week, the others are observed by special articles in the Press and festivities after business hours. The chief of them are:—

New Year's Day, Red Army Day (February 23), International Women's Day (March 8), March Revolution Day (March 12), Lena Goldfields Memorial Day (April 17), International Sports Day (July 7), International Anti-War Day (August 1), Soviet Aviation Day (August 18), International Youth Day (September 1).

The calendar still includes also the Day of the Paris Commune, Peasants' International Day, Lenin's Birthday, Harvest Day, Cooperative Day, and others, but their celebration is luke-warm and does not involve a cessation of work. In contrast to the earlier period, work has now, indeed, become more important than holiday-making, and the celebration of extra rest days is discouraged. New Year's Day, for example, is a traditional holiday in Russia, and a large proportion of operatives continue to celebrate it whether their factories close or not. To cope with this "evil" without increasing the number of holidays the Government announced last December that the rest day of Dec. 30 should be transferred to Jan. 1.

Tampering with the calendar began as far back as 1918. Russia had remained true to the Julian Calendar, but the Revolution adopted the Gregorian instead, thus coming into line with Western countries. This was decidedly more convenient for international intercourse, but local authorities began to emulate the French Revolution and to show their revolutionary zeal by altering the names of the months and days, substituting the names of Pugacheff and Stenka Razin for Easter and Christmas, and making other changes in the spirit of the age. But when the Central Government obtained real control, all these local innovations were cancelled.

During the period of the New Economic Policy (1921-28) there was little interference with the calendar beyond the introduction of a few more "noteworthy revolutionary days." Official almanacs of that period show a curious mixture of revolution and religion. Religious festivals survived in Soviet almanacs until 1929; but in 1930 the words Easter, Christmas, Whitsuntide, and all the other feast days were expunged from the calendar. The names of saints recognized by the Orthodox Russian Church were condoned and printed by Soviet authorities for several years longer. Even as late as 1931 the official almanacs, printed in hundreds of thousands, recorded the "name days" of saints for every day of the year in

much the same way as they were noted under the Tsars. But new names were added which are not usually associated with saints and religion. Thus, against the date April 22 we have: Vsevolod, Clement, Vladlen (a new name formed by telescoping Vladimir and Lenin); Vladlen appears also against January 30; January 1 has Vasili and Spartacus; January 22, Timothy and Marseillaise. Other new names added to the saints of the calendar are: Octvabrina (October), Communar, Brutus, Avieta, Marat, Altai, Lena, Electra, and Ninel (Lenin spelt backwards).

The Central Government at Moscow made its first determined assault on the seven-day week in September 1929, with a decree ordering the general introduction of a five-day week. The avowed purpose of this reform was to combat religion by abolishing the common weekly rest-day. Factories were to be kept working incessantly day and night. The operatives were divided into five "colours," each having a red, blue, yellow, or other "labour calendar." On any given day or night four "colours" would be working, and the other "colour" enjoying or otherwise spending its day of rest. Thus the reds had their day off on the 1st, 6th, 11th, 16th, 21st, and 26th day of each month, the blues on the 2nd, 7th, 12th, and so on. A man and wife would never have the same day free unless they managed to get the same colour. If there were more members in the family it became still more difficult to synchronize the rest days, and the plan served the additional purpose—then considered useful—of breaking up family life.

Experiments had been made with the five-day week since 1927, but after it became compulsory in 1929 the difficulties and discontent increased rapidly. The authorities then discovered that much of their anti-religious object could be attained without mixing up the rest days, and also the old idea had come to the fore again that family life was an institution to be fostered rather than destroyed. The colour system was abolished in 1932, the labour week lengthened to six days, and a common rest day reintroduced for all. Only certain public services and some shops now work on this day, but here, too, the workers have a six-day week; five days of work and one day free, though for the convenience of others their rest day does not coincide with that of the general public. Nearly all newspapers appear on five successive days and then miss a day; but *Pravda*, the central organ of the party, is published on all the six days of the Soviet week.

The seven-day week, with Sunday as a day of rest, is still holding out on the countryside, in spite of the advanced stage of collectivizing and industrializing rural husbandry, but it is viewed with official disfavor and is being superseded as fast as possible by the six-day labour week now firmly established in the towns. It may be added that, although the working week is shorter in Russia than elsewhere, there is no such thing as half-day work on Saturday or the day preceding the common day of rest.

LEAP YEAR'S FAREWELL

By ELSA FORD

LEAP YEAR has said its fond adieus to February. It is vacating its long lease of the 29th day of the second month and taking a new dwelling place between June and July. February 29, Leap Year Day, is dead. Bid it farewell. For the League of Nations now is considering a revised calendar and adoption of the new plan seems certain. When this much needed and universal reform is approved, the quadrennial extra day, atoning for calendar error, will be placed in the middle of the year. It will be an extra Saturday following June 30th, will bear the name of Leap Year Day and probably will be an international holiday.

Leap Year especially focuses our attention on the subject of error in the calendar, for its function is to keep the calendar in step with the seasons. It is the calendar "corrector." It was introduced for the very purpose of eliminating inevitable mathematical and astronomical errors.

It is extremely difficult to construct a calendar which will coincide exactly, within seconds with the tropic or seasonal year. This is due to the fact that the two revolutions involved in determining the length of the day and of the year bear no direct relationship to each other. The gears of the cosmic timepieces do not mesh perfectly and astronomers have to act as mechanics and oil the machinery to eliminate as much friction as possible. Leap Year is the lubricant which they use.

Our day is determined by one revolution of the earth on its own axis and one revolution of the earth around the sun constitutes a year. How convenient it would have been if this could have resulted in an even number of days in the year! But such is not the case. A solar year contains 365.24219879 days or 365 days, 5 hours, 48 minutes and 46 seconds. Leap Year takes care—almost—of those extra 5 hours, 48 minutes, 46 seconds.

From researches in the British Museum and the Cairo Museum, it has been discovered that the first appearance in Egypt of a Leap Year "rule" came late in the 1st century B. C. But long before that, the great mathematician-priests of that agricultural nation had seen the necessity for such a calendar stabilizer. Through determining the length of the solar year by means of the angles and shadows of the pyramids and by sighting fixed stars such as Sirius, the people of the Nile knew there were approximately $365\frac{1}{4}$ days in a solar year. The first solar calendar was constructed. It had months of 30 days each, 4 of which made a season, the three seasons being Flood Time, Seed Time, Harvest Time. The year was completed by five festival holidays and the fraction remaining was allowed to accumulate but carefully recorded.

The importance of Leap Year in the Egyptian calendar becomes apparent when one realizes that it was the prototype of the Julian and Gregorian calendars which formed the basis of our modern system of reckoning. The next important step in the history of the Leap Year came when Julius Caesar, combining scientific interest with military and amatory conquest, seized upon the Egyptian method of calendar calculation as a means for abolishing the manifold absurdities of the Roman calendar. But Caesar was not primarily interested in pure and abstruse scientific advancement. Oh, no! That skilled political strategist was concerned with increasing his own power as dictator of the Roman state.

Various absurd explanations of Roman calendar reform appear all too often in the books of supposed authorities but the real explanation, based on our examination of the original sources, undoubtedly was Caesar's struggle to achieve and hold power. The pontiffs, regulators of the old Roman calendar, added or failed to add days as it pleased their fancy, their purses and their political aspirations. Under Roman traditions they set all dates for elections, public holidays and religious festivals. Caesar took this power out of their hands.

When he took the step, especially correcting the year-length irregularities by means of a regular Leap Year, he introduced to the western world the calendar calculation which has endured to our own day. The old Roman calendar of Romulus and Numa Pompilius, based on the moon, provided for a year of 355 days, too short by approximately $10\frac{1}{4}$ days. To correct this error, an extra month, alternately 22 and 23 days, was intercalated as an early Leap Year measure every other year between the 23rd and 24th of February. Over a four-year period, 45 days were added or $11\frac{1}{4}$ days a year, making $366\frac{1}{4}$ days as the mean value for the year's length. Each year was 1 day too long and this was corrected by means of a 24-year cycle. In the last eight years of the cycle, 66 days instead of 90 were added. It took the Romans a period of 24 years to obtain the approximate correct mean value of $365\frac{1}{4}$ days for the solar year.

Prior to Julius Caesar another attempt had been made to simplify the involved reckoning of Roman Leap Year rules. The intercalary month was abolished by the Decemviri and the pontiffs were given authority to insert, as necessary, a longer month called Mercedonius. Calendar confusion became worst confounded. The correct date for the vernal equinox is March 25. By Caesar's time, calendar errors by Roman reckoning had placed the vernal equinox in summer, on or about June 5. The Roman farmers had even more to complain of than our agriculturists today. For they didn't know if March would find snow or a scorching sun.

Then Caesar built a new body on the old calendar chassis and put on a Leap Year governor to stop the runaway seasons. Macrobius and the lesser-known Censorinus recount the feat. In his "The Natal Day," Censorinus writes, "As to the quarter of a day which it seems completes the true year, he (Julius Caesar) directed that one day be intercalated after each period of four years, where the month was formerly placed, that is after Terminalia (February 23) which is now called bissextile day."

The "Saturnalia" of Macrobius corroborates the record. It says, "Julius Caesar added 10 days to the former number in order to complete the 365 days which the sun takes to pass through the zodiac; and to take account of the quarter of a day, he directed the pontiffs, who were intrusted with the months and days, to intercalate one day every four years in the same month and in the same place the ancients had intercalated, that is, before the last five days of February, hence called bissextile."

The Julian calendar, started in 46 B. C., was to endure for 16 cen-

turies. In its first years, the calendar was not correctly followed as to its leap year rule. Caesar had been assassinated and thus his keen intellect was not available as a guide during the infancy of the new calendar. The pontiffs made every third year instead of every fourth, a Leap Year. This very likely was due to the Roman custom of counting both the first and last years in determining the Leap Year. Whatever its cause, it continued until twelve Leap Years had been observed instead of nine.

This error was corrected by Augustus, who followed Julius Caesar. Macrobius tells that Augustus had the correct Leap Year rule engraved on a table of brass to insure its continued correct observance.

Even though the Julian calendar represented a great improvement over the moon calendar which the Romans had been using, it was proved faulty after a few hundred years of use. With Julius Caesar's rule of one Leap Year in every four, the official calendar year was eleven minutes longer than the seasonal year. It was observed that the date of the spring equinox was slowly moving back from its original place of March 25th.

Although but a few hundred years were enough to show that the civil calendar was not keeping step accurately enough with the astronomical calendar, a change was slow in coming. Faulty reckoning continued for fifteen centuries during which time a change was often proposed but never effected. Religious tradition as well as lack of agreement as to the form of the change held it back. Rulers joined with the clergy in a century of discussion preceding the correction finally made by Pope Gregory XIII.

In 1582, Pope Gregory issued his Papal Bull in which Caesar's Leap Year rule was changed so that after the year 1600, the leap days of three centurial years in every four would be omitted. That is, in every period of four hundred years three Leap Years would be kept as common ones. He also corrected the existing error by making Oct. 5, 1582, the 15th.

Now the entire civilized world is reckoning time according to the Leap Year rule laid down by Gregory in his Papal Bull. Our civil year keeps step very well with the astronomical seasons but there still remains some error in the calendar, an error which continues to accumulate. This error amounts to 37.3 minutes in every one hundred years which is equivalent to .373 minutes a year, or one day in 3861 years. Dates can be kept in their proper places until 4000 under the present Gregorian system.

Eventually some change will have to be made in Leap Year rules in order to even further reduce the calendar's error. In a pamphlet by the United States Bureau of Education, a simple correction is suggested: "The year 4000 by Pope Gregory's rule should be a leap year. If it is kept a common year and if all those years the numbers of which can be divided by 4000 are kept as common years, our calendar will keep so well in step with the traveling of the earth around the sun that no date will move more than one day from its proper place for 20,000 years."

EDUCATIONAL CONSIDERATIONS

By HILDA SIDNEY GRUENBERG

Swarthmore College

SOME time ago the Dean of a College was heard to say, "If, when they promoted me from Head of the English Department to Dean of Men, I had known that my mind would be occupied with football schedules, falling plaster in the dormitories, dates for holidays, and complaints about the food, I would never have accepted the promotion."

It is true, of course, that any man in an executive position must concern himself to some extent with trivialities. It is one of his duties to see that the purely mechanical functioning of his institution—whether it be a clothes pin factory, or a moving picture studio, or a hall of learning—be as smooth as possible. It is true, furthermore, that most of this work, the making of schedules, the hiring of the handy man to fix the plaster, the firing of the chef, is done by people who are subordinate to the Dean. They actually bother him with it only when the gaps in the ceiling are particularly large, the dates in the calendar particularly stubborn, the indigestion particularly acute. The rest of the time he gives his orders and then checks over the work when it is done. But whoever does the tedious work, it takes time and effort and worry. A certain amount is inevitable, but any suggestion for reducing it to a considerable extent would be more than welcome.

A large amount of the mechanical arrangements for the running of an educational institution in any one year is necessarily dependent on certain important dates and the days of the week on which they fall. Some years things work out beautifully, so that the Christmas and Easter vacations fall naturally within the one or two weeks allotted to these festivities, and the one-day holidays drape themselves gracefully around the week-ends and fall on either a Friday or a Monday. More often, however, the major holidays come at such a time that they cut into the week. The vacations have to be longer or shorter than is desirable, and the one-day holidays come on a Tuesday or a Wednesday or a Thursday.

The inmates of Deans' offices seem to get as many headaches over the task of arranging examination schedules as they do over the vacation schedules. In a way it is even worse because many of them are determined to be fair to the students and work out a system whereby the Juniors won't have a tremendous advantage over the Freshman, or the Engineering students won't feel that the Greek majors are getting a better break.

Besides the inevitable yearly occurrence of Election Day and French examinations, the so-called "extra-curricular activities" are increasingly taking their place as a vital and significant part of college and university

life. They give rise to a whole new set of schedules to be worked out within the framework of the academic year. The Sophomore Show, the monthly meetings of the Philosophical Society, the Tennis Tournament all have to be placed on days that are most advantageous to the group of people participating and, at the same time, will interfere least with other activities.

No one, however much of a fanatic he may be on the subject of calendar reform, would claim that these problems would disperse into thin air on the day that The World Calendar is universally accepted. He *would* maintain, however, that they could be most intelligently, most efficiently solved if they could be considered *one* year for *all* years. It would be worth while to make a college or university calendar to meet the aforementioned demands, if one knew that the same performance would not have to be repeated the next year and the next year and the next. The powers that be would be glad to give their attention to these issues—trifling in the singular, but gigantic when one realizes that all of them together determine the year's harvest. They would not be tempted to say that it doesn't make much difference one way or the other, because this is a particularly awkward year and so they might as well have a makeshift arrangement and hope that next year will be better. They would realize that *this* year is *every* year and that if a suitable calendar is devised, it will serve for all time.

Let it not be thought that only the workers behind the scenes would gain by the adoption of a stable and carefully planned academic year. All those directly or indirectly connected with the ever increasing and ever growing educational institutions would benefit. The students themselves would get most out of their college years if the extra-curricular activities were so planned as to interfere least with class hours. Then, too, if all middle-of-the-week holidays were eliminated or changed, teachers agree that this would have a decidedly beneficial effect on class work. Professors, as well as students, are more restless and less attentive on the days preceding and following one-day holidays. Three day week-ends, on the other hand, tend to send students and teachers back to work, refreshed and ready for mental exercise.

With the increased adoption of the seminar system, we find another demand on our calendar, a demand that it be stable and that the quarters be of equal length. Many colleges (notably Harvard, Dartmouth, and Swarthmore), as well as the graduate divisions of all the large universities, have substituted long weekly seminars in two subjects for short daily classes in four or five subjects. These changes affect from 25 to 90% of the students in the various institutions. This means, of course, that each meeting of the group is increased in its importance three to five-fold, and that missing one seminar is equivalent to missing three to five ordinary classes. Sometimes students have had to come back from their vacations a

day or two early in order to get in an additional seminar that would otherwise be skipped because of the way the dates fell on a particular year.

Sometimes they have squeezed one in on a Sunday night, or shifted Tuesday's seminar to Wednesday because of a holiday, thus leaving only one day between it and the other seminar for the week which would probably come on Friday. It doesn't matter, of course, when a particular seminar comes, but it *does* matter whether or not there has been adequate time for preparation. Many students and professors agree that a "squeezed in" seminar is worth practically nothing at all. Quarters of equal length, a calendar that is the same every year, would enable the administration to plan for the desired number of seminars and to space them better.

Another movement that has become popular in education is the plan for combining academic studies with experience in the world of business or the professions. This plan was originated at the University of Cincinnati and has been adopted with conspicuous success at Antioch College. The course takes six years instead of the usual four, but half of the student's time is spent in working at some job in the line he hopes to follow after graduation. The student body is divided into two groups, and each student in Group A shares his job with a co-worker in Group B who works on the job when it is student A's turn to study. This plan has many obvious advantages for students of certain types and for those of limited financial resources and for those interested in certain kinds of businesses or professions. But it is equally obvious that making out the program for an arrangement of this sort entails overcoming many obstacles, of which an irregular, shifting calendar is the greatest. The plan is satisfactory only if it can be so worked out that the students in Group A have exactly as many studying days, working days, and holidays as the students in Group B. Again, it would be worth while for the executives of such an institution to expend a considerable amount of mental energy in devising such a program, *if* they knew that it was to be followed in every succeeding year.

Lastly, it would be definitely advantageous to have all the universities and colleges cooperate in determining the calendar for the school year. This certainly does not mean that the Freshman Hop or Le Cercle Francais should be held on the same night every year the country over. Each college could arrange its activities to meet the needs of its own organizations, its own students and professors. It is the general frame of the academic year that should be adopted by all the universities to their mutual advantage. This means, for the most part, the opening and closing dates, vacation and holiday dates. In many families where the children go to different colleges, their vacations overlap by a few days only and sometimes (this year's Easter vacation is a case in point) they haven't even one day together. This may not seem to be of vital importance to the reader who plays an important role in business matters or affairs of state. But I am sure that anyone who stops to consider that in many families vacation time is the only chance they have for a complete reunion, will realize what it would mean to thousands of families the country over to have standard vacation times. And leaving sentiment out of it altogether, the educators would benefit, for it is during vacations that national conferences are held. Having the opportunity to meet and exchange ideas with people who are working on projects in similar or related fields, is not only pleasant and stimulating to individuals, but of benefit to education in general.

CHANGES IN TIME

By HERBERT B. NICHOLS

Natural Science Editor of the Christian Science Monitor

CHICAGO seceded from the Middle West a short time ago. By advancing her clocks one hour the Windy City became an island of eastern time in a sea of central standard time.

Modern methods of transportation and communication are held responsible. Fast express planes leaving Chicago can land in New York five hours later by the clock, and the radio brings both cities as near together as the Cohens and the Kellys across a tenement court.

It's the same old story of half a century ago, only today it appears in more modern garb. When it took a month for messages to cross the Atlantic one way, and the Middle West was at least two weeks from "the big city" by pony express, differences of an hour or two in time bothered no one. Then came steam carriages and messages by telegraph.

Despite vehement objections to "meddling with the Lord's time," 1883 saw four standard time zones adopted in the United States, and the arrangement quickly spread to Europe and the Far East. Previously, every city and town set its own clock by the sun and scarcely two agreed.

Meanwhile, the railroads, though prime movers in the adoption of the zones, did not legalize their use until 1918, when Congress delegated to the Interstate Commerce Commission power to regulate railway time scales. Even the zones themselves are not clear-cut boundaries, running straight up and down like meridians, but zigzag hither and yon, influenced largely by the location of railroad division points.

But Chicago is more than an oasis of eastern time in the broad central belt. She stands as the symbol of scientific and commercial controversy which portends changes not only in existing time scales as they pertain to the world's clocks, but in the calendar as well.

At the last meeting of the American Association for the Advancement of Science in St. Louis, time scale changes was one of the dynamite-loaded subjects introduced for discussion in the astronomy section.

Bemrose Boyd, University of Iowa delegate to the meeting, pointed out that, at the latitude of New York, one hour of time corresponds to about 784 miles of earth's surface, which is just a whip, whir and whiz for transport planes. He also drew attention to the intricacies of deciphering the present muddle of world radio timetables. Divisions into two, three and six-hour time zones were discussed for the United States.

Elliot Smith's proposal, advanced in 1918, that the nation adopt ninetyth-meridian time, the actual sun time of the Mississippi River roughly speaking, received much favorable comment. According to this plan, the

clocks of the entire continent would read the same hour and everyone would have "North American time." Chicago, however, is the first to originate a radical change.

The attack on the calendar, which is likewise a matter of accurate time computation, is an even older problem—one which was hoary when Cheops built the Pyramids of Gizeh. The year is determined by astronomical observations of the time it takes the earth to make a complete trip around the sun, and the length of a day is the time it takes the earth to make a complete turn on its axis.

Unfortunately, it happens that the number of days it takes the earth to complete its orbit and the number of hours required for a spin on its axis do not come out in even numbers. One thinks of the year as 365 days and the day as twenty-four hours, but actually the year is exactly 365 days 6 hours 9 minutes 9.6 seconds, and the day is 23 hours 56 minutes long.

In February of most Leap Years an extra day is added to the calendar to keep it in step as much as possible with nature, but even this does not suffice. The calendar year is still twenty-four seconds longer than it should be to be absolutely correct.

The modern calendar is an outgrowth of changes made in the existing calendar of 47 B. C., at which time it became evident that, unless corrections were applied, Roman farmers would be harvesting their crops in the spring, and winter would change places with summer. Julius Caesar ordered a calendar then which lasted without change for 16 centuries.

Then in 1582, Pope Gregory revised it in such a way as to match more closely the motion of the moon and at the same time the orbital journey around the sun. Oct. 5, 1582, became Oct. 15—and the Gregorian calendar under which we live today came into effect.

"But why change the calendar when the errors are apparently of academic importance only?" someone is sure to ask.

That's just it, the reform of the calendar has left the category of academic discussion, for it affects the life of every individual.

Business in particular demands uniformity in the calendar. Charges of inconvenience, irregularity and cost are hurled in its direction. Every year is different and no one can tell, except by referring to astronomical textbooks, how the days of the month ran in connection with weekdays four or five years back. Employees paid by the month find one with 28 or 29 days, four with 30 and seven with 31. The quarters of the year have 90, 91, or 92 days, and the first half-year has either 181 or 182 days, while the last half has 184.

The orthodox church runs into difficulty trying to figure out the vacillations of Easter Sunday. School and college calendars have similar troubles with Spring and Christmas recesses. The exodus of the spring tourist and the advent of Labor Day are factors which vitally influence the hotel busi-

ness, transportation companies, resorts and automobile service stations.

Instability of the Easter date makes it difficult for stores to synchronize trade and business requirements. At this season, department stores, clothing stores, florists, and all textile and hat industries throughout the world reach a peak in trade. If Easter is early, trade suffers because people continue to wear winter clothing until warmer weather comes, while if it is too late, the public decides not to invest in spring commodities.

Similar stories are told in other lines, in the courts, in legislation and in government. Irregularities crop up in finance, accounting, shipping, banking, insurance, labor, production, investment, real estate and so on ad infinitum—until 44 nations of the world have decided to take active part in the League's attempt to straighten things out.

Though more than 500 different plans for changing the calendar have been put forth in recent years the choice narrows down to either The World Calendar or the 13-month calendar.

After all, the calendar is merely a mechanical device the world has found handy for carrying on its daily business. It can scarcely be called sacred, even though the church as well as state uses it for recording events. Julius Caesar saw fit to appropriate a day from February to give his own month of "July" 31, and Augustus Caesar likewise stole from February to fatten his namesake, "August," so why should the powers in 1936 hesitate to change things around for the sake of convenience rather than selfish pride?

OBITUARY NOTES

THE Right Reverend Elmer Nicholas Schmuck, Bishop of Wyoming, died on April 28th at the age of 53. Bishop Schmuck was instrumental in gaining endorsement for The World Calendar by the Episcopal Church and advocated a national convention of authorized representatives appointed by all the churches to endorse the 12-month plan and urge its adoption on the governments of the world.

MR. J. HAROLD DOLLAR, first vice-president of the Dollar Steamship Company, founded by his father, the late Robert Dollar, died in San Francisco on April 7th. He had long been interested in the calendar reform movement.

DR. W. F. BADE, discoverer of Mizpah in Palestine, died on March 4th. An expert on Semitic language and an authority on the Old Testament, Dr. Bade was Professor of Semitic Languages and Comparative Literature at the Pacific School of Religion at Berkeley, California. He was one of the earliest members of The World Calendar Association. His membership dates from July, 1931.

OTHER deaths among the membership of The World Calendar Association during the past few months included: Orra E. Monnette, vice-president of the Bank of America; William J. Bogan, Superintendent of Schools in Chicago; Professor Rasmus Bjorn Anderson, director of the Scandinavian Department of the University of Wisconsin; Dr. John Hope, president of Atlanta University; Mrs. Arthur Hutchinson, associate professor of economics at Vassar College; Francis Sparacino, editor and publisher of The Nassau Daily News; and Captain Marcus H. Tracy, a prominent figure in New York shipping circles.

LABOR SPEAKS AT GENEVA

MOST important among the international conferences of the summer was the meeting of official delegates to the International Labor Office at Geneva, in June. Calendar reform came prominently before this gathering of government delegates from the great powers. After discussion in the committee on resolutions, a formal motion urging revision of the calendar was brought before a plenary session on June 24, and was passed unanimously. Text of the resolution was as follows:

Considering that the Eleventh Session of the International Labor Conference, held in Geneva in June, 1928, passed a resolution in favor of calendar reform, drawing attention to the interest which this question has for the workers on account of its relation with the rationalization of work and labor statistics and the regularization of public holidays;

Considering that the Secretariat of the League of Nations has asked the International Labor Office to communicate to it periodically any information which it can obtain concerning the attitude to this question of the workers;

Considering that it is a well-recognized fact that the present calendar is very unsatisfactory from economic, social and religious standpoints, and that recent studies, investigations and reports have shown that there is a marked trend of opinion in favor of its revision;

Considering that the resolution concerning calendar reform adopted by the Labor Conference of American States which are members of the International Labor Organization, at its session held at Santiago in January, 1936, recommends the adoption of the perpetual calendar of 12 months and equal quarters;

The International Labor Conference at its Twentieth Session requests the Governing Body of the International Labor Office to call the attention of the Council of the League of Nations to the question of calendar reform and to ask it to recommend the Committee on Communications and Transit of the League of Nations to continue to study the whole of this question very closely at its meeting in 1936; and

Requests that copies of this resolution should be communicated to the Secretary-General of the League of Nations and to the States Members and non-Members of the International Labor Organization.

Addresses introducing the resolution were made by Garcia Oldini, delegate of Chile and chairman of the Committee on Resolutions; Gajardo Villarroel, of Chile; and Senator Corneille Mertens, of Belgium, vice chairman, of the Governing Body of the International Labor Office and president of the workers' delegates.

WEEKLY BUSINESS PERIODS

By H. W. BEARCE

U. S. Bureau of Standards

(Publication Approved by the Director of the Bureau of Standards of the U. S. Department of Commerce)

DISCUSSIONS and addresses held under the auspices of the American Statistical Association have clearly brought out a fact that is often overlooked—namely, that a sharp distinction should be made between the adoption of a weekly, bi-weekly, or 4-weekly business period for statistical purposes and revision of the civil calendar. The necessity for this distinction is clearly evidenced by the fact that there is now in use a wide variety of weekly business and accounting periods without any reference to revision of our civil calendar. It cannot, therefore, properly be held that revision of our civil calendar on a 4-weekly, 13-monthly, or any other basis, is a necessary prerequisite or accompaniment to the use of weekly periods for statistical purposes.

On the other hand, it can readily be shown that revision of our calendar in such a way as to make it perpetual would make the use of weekly, bi-weekly and 4-weekly periods much more convenient for statistical purposes than is the case under our present calendar.

What is meant by a “perpetual” calendar is, of course, a calendar in which January 1 always falls on the same day of the week. Under a perpetual calendar there would be no “cycling” of January 1 or any other given date, through the various days of the week. That is, any given date of any given month would always fall on the same day of the week.

The average length of our calendar year, under the Gregorian leap-year rule, is 365.2425 days, while the length of the tropical, or solar year, according to Newcomb’s equation, is 365.2422 days. This difference, amounting to one day in 3300 years, can if desired be corrected by a slight modification of the leap-year rule.

If we wish to adhere to our present leap-year rule and at the same time set up a perpetual calendar, all that is necessary is so to divide the calendar year that the 365.2425 days will be included in a whole number of complete weeks, with no remainder. Since 52 7-day weeks will account for 364 days, it is seen that the annual excess of 1.2425 days must, in some way, be included in the 52 weeks, if we are to have a perpetual calendar.

It would, of course, be extremely inconvenient and confusing to have a fractional part of a day included in any calendar year. Fractional days are avoided by making some years contain 365 and others (leap years), 366 days. By a proper distribution of ordinary years and leap-years, as for example, under the Gregorian leap-year rule, the calendar year and

the solar year are kept sufficiently close to the same length to prevent a wandering of the seasons through the calendar year.

We have, therefore, in each ordinary year one day in excess of 52 weeks, and in each leap-year two days in excess of 52 weeks. What to do with these extra days is the problem which must be solved if we are to retain the 7-day week and at the same time have a perpetual calendar.

It will be noted that up to this point the question has been how to obtain a perpetual calendar, which all agree is desirable. From this point on, the question will be how best to subdivide the 52-week perpetual calendar in order that it may attain a maximum of convenience and usefulness. On this point there is a wide diversity of opinion.

The most natural procedure would be to divide the 52-week year into halves of 26 weeks each, and quarters of 13 weeks, or 91 days, each. Each quarter may also be subdivided into months; but the months cannot be equal, and each month cannot contain a whole number of complete weeks. The best that can be done under this method of subdividing the quarters is to have in each quarter one month of 31 days and two months of 30 days each. Such a calendar would differ but little from our present Gregorian calendar. Its principal advantages would be: (a) that the calendar would be perpetual; (b) that its quarters would be equal; (c) that each month would have 26 week-days; (d) that corresponding periods in successive years would be comparable; (e) that 12 is divisible in various ways.

The disadvantages of this plan are: (a) that its months would not be exactly equal, and (b) that each month would not contain a whole number of complete weeks.

An alternative method of subdividing the 52-week calendar year would be to divide it into 13 periods of 4 weeks, or 28 days, each.

The advantages of this plan would be: (a) that the calendar would be perpetual; (b) that its "months," or 4-week periods, would be equal; (c) that each period would contain a whole number of complete weeks, and (d) that corresponding periods in successive years would be comparable.

The disadvantages of this plan are: (a) that it would be a wide departure from our present calendar; (b) that 13 not being evenly divisible into halves and quarters, the end of the first, second and third quarters would not coincide with the end of a month; (c) that the 28-day periods would not be comparable in length with our present months (except February); (d) that these 4-week periods would be displaced by varying and excessive amounts from the present months; (e) all dates above 28 would have to be dropped, and (f) a new month would have to be added to the calendar.

There is wide diversity of practice among those who are using weekly business periods under our present calendar. This diversity arises largely as a result of differences in the method of taking into account the extra 1 day or 2 days of each year in excess of 52 weeks. Some include the extra day or days in the last week of the year; others allow the extra days to accumulate for 5 or 6 years and then put in an extra week at some point in the calendar year; some put this extra week at one point in the calendar and others at other points. The result of this diversity of practice is that production, sales, and other figures based on periods of varying length and arrangement are far from comparable.

This diversity of practice in the use of business periods based on the week and multiples of the week would be largely overcome by the adoption

COMPARISON OF 1-WEEK, 2-WEEK, AND 4-WEEK ACCOUNTING PERIODS

Under the 12-month equal-quarters plan, and the 13 equal-months plan of calendar revision

Perpetual Calendar Plan	1st Week	2nd Week	3rd Week	4th Week
12-month.....	Jan. 1—Jan. 7	Jan. 8—Jan. 14	Jan. 15—Jan. 21	Jan. 22—Jan. 28
13-month.....	Jan. 1—Jan. 7	Jan. 8—Jan. 14	Jan. 15—Jan. 21	Jan. 22—Jan. 28
Calendar Plan	5th Week	6th Week	7th Week	8th Week
12-month.....	Jan. 29—Feb. 4	Feb. 5—Feb. 11	Feb. 12—Feb. 18	Feb. 19—Feb. 25
13-month.....	Feb. 1—Feb. 7	Feb. 8—Feb. 14	Feb. 15—Feb. 21	Feb. 22—Feb. 28
Calendar Plan	9th Week	10th Week	11th Week	12th Week
12-month.....	Feb. 26—Mar. 2	Mar. 3—Mar. 9	Mar. 10—Mar. 16	Mar. 17—Mar. 23
13-month.....	Mar. 1—Mar. 7	Mar. 8—Mar. 14	Mar. 15—Mar. 21	Mar. 22—Mar. 28
End 1st Quarter		Begin 2nd Quarter		
Calendar Plan	13th Week	14th Week	15th Week	16th Week
12-month.....	Mar. 24—Mar. 30	Apr. 1—Apr. 7	Apr. 8—Apr. 14	Apr. 15—Apr. 21
13-month.....	Apr. 1—Apr. 7	Apr. 8—Apr. 14	Apr. 15—Apr. 21	Apr. 22—Apr. 28
Calendar Plan	17th Week	18th Week	19th Week	20th Week
12-month.....	Apr. 22—Apr. 28	Apr. 29—May 4	May 5—May 11	May 12—May 18
13-month.....	May 1—May 7	May 8—May 14	May 15—May 21	May 22—May 28
Calendar Plan	21st Week	22nd Week	23rd Week	24th Week
12-month.....	May 19—May 25	May 26—June 2	June 3—June 9	June 10—June 16
13-month.....	June 1—June 7	June 8—June 14	June 15—June 21	June 22—June 28*
End 2nd Quarter		Begin 3rd Quarter		
Calendar Plan	25th Week	26th Week	27th Week	28th Week
12-month.....	June 17—June 23	June 24—June 30*	July 1—July 7	July 8—July 14
13-month.....	Sol. 1—Sol. 7	Sol. 8—Sol. 14	Sol. 15—Sol. 21	Sol. 22—Sol. 28
Calendar Plan	29th Week	30th Week	31st Week	32nd Week
12-month.....	July 15—July 21	July 22—July 28	July 29—Aug. 4	Aug. 5—Aug. 11
13-month.....	July 1—July 7	July 8—July 14	July 15—July 21	July 22—July 28
Calendar Plan	33rd Week	34th Week	35th Week	36th Week
12-month.....	Aug. 12—Aug. 18	Aug. 19—Aug. 25	Aug. 26—Sept. 2	Sept. 3—Sept. 9
13-month.....	Aug. 1—Aug. 7	Aug. 8—Aug. 14	Aug. 15—Aug. 21	Aug. 22—Aug. 28
End 3rd Quarter		Begin 4th Quarter		
Calendar Plan	37th Week	38th Week	39th Week	40th Week
12-month.....	Sept. 10—Sept. 16	Sept. 17—Sept. 23	Sept. 24—Sept. 30	Oct. 1—Oct. 7
13-month.....	Sept. 1—Sept. 7	Sept. 8—Sept. 14	Sept. 15—Sept. 21	Sept. 22—Sept. 28
Calendar Plan	41st Week	42nd Week	43rd Week	44th Week
12-month.....	Oct. 8—Oct. 14	Oct. 15—Oct. 21	Oct. 22—Oct. 28	Oct. 29—Nov. 4
13-month.....	Oct. 1—Oct. 7	Oct. 8—Oct. 14	Oct. 15—Oct. 21	Oct. 22—Oct. 28
Calendar Plan	45th Week	46th Week	47th Week	48th Week
12-month.....	Nov. 5—Nov. 11	Nov. 12—Nov. 18	Nov. 19—Nov. 25	Nov. 26—Dec. 2
13-month.....	Nov. 1—Nov. 7	Nov. 8—Nov. 14	Nov. 15—Nov. 21	Nov. 22—Nov. 28
End 4th Quarter		52nd Week		
Calendar Plan	49th Week	50th Week	51st Week	52nd Week
12-month.....	Dec. 3—Dec. 9	Dec. 10—Dec. 16	Dec. 17—Dec. 23	Dec. 24—Dec. 30**
13-month.....	Dec. 1—Dec. 7	Dec. 8—Dec. 14	Dec. 15—Dec. 21	Dec. 22—Dec. 28**

* Followed each leap-year by "Leap-year Day," June L or June 31, (June 29 under the 13-month plan), a 24-hour holiday period and an extra Saturday.

** Followed each year by "Year-end Day," December Y or December 31, (December 29 under the 13-month plan), a 24-hour holiday period and an extra Saturday.

of a perpetual calendar on either the 12-month or the 13-month plan. A business period expressed in weeks is practicable under either plan.

There is a tendency on the part of some advocates of the 13-month calendar to place on the 12-month calendar all blame for the irregularities that now occur in the use of weekly business periods, and to claim that these irregularities would be overcome by adoption of a 13-month plan.

For example, L. J. Stewart, Comptroller of the Western Clock Co., in a paper first presented in 1928, makes the following statement: "We may truthfully ascribe all our calendar irregularities to the use of the 12-month calendar."

Careful reading of Mr. Stewart's paper will show that statement to be not justified. The type of irregularities that Mr. Stewart is discussing throughout his paper arises not from the fact that our calendar is a 12-month calendar but from the fact that it is not a perpetual calendar; that is, that in each year there is a period of 1 day, or 2 days, in excess of 52 weeks.

These irregularities will be overcome, not by adopting a 13-month calendar, but by adopting a perpetual calendar.

Having first adopted a perpetual calendar of 52 weeks we can then divide the 52 weeks into either a 12-month, or a 13-month calendar. In either case 13 equal 4-week periods would make up a complete calendar year; and corresponding 4-week periods would be comparable for all years. There is no necessity whatever of giving to these 4-week periods the names of months.

The 4-week periods, Jan. 1 to Jan. 28, Jan. 29 to Feb. 25, Feb. 26 to March 23, March 24 to April 21, etc., would be just as definite and just as comparable as though we designated the same periods as Jan. 1 to Jan. 28, Feb. 1 to Feb. 28, March 1 to March 28, April 1 to April 28, etc.

The principal difference between the two plans is that under the 12-month equal-quarters perpetual calendar, anyone who wished to do so could use 4-week periods for business and statistical purposes, and could continue to use the regular months and quarters for all other purposes; whereas, under the 13-month plan, everyone would be obliged to use the 4-week periods for all purposes.

If it is admitted that business periods expressed in weeks can be used as conveniently under a 12-month equal-quarters perpetual calendar, as under a 13 equal-months perpetual calendar, then the argument in favor of a 13-month calendar no longer exists.

If the use of a business period based on the week is as desirable and as convenient as its advocates believe it to be, even under our present calendar, would it not be good strategy for all who favor calendar revision to unite their efforts toward the adoption of a perpetual 12-month equal-quarters calendar without sacrificing the practical 12 months and the equal-quarter and half-divisions? It is also obvious that a greater scope of application exists in this plan.

It may well be that the perpetual 12-month equal-quarters calendar will be found so satisfactory for business, statistical, and all other purposes, that even the advocates of the 13-month plan will be entirely satisfied without further change.

ROMANCE OF THE CALENDAR

By P. W. WILSON

CHAPTER V: DEMAND FOR MEASUREMENT

SINCE the dawn of history, the world has been, as it is today, accustomed to the conception of measurement. That conception has included length, volume and weight. The Greeks had a furlong of 606 feet 9 inches to which they applied a name, stadion—Latin stadium—that is in use to this day. The Romans had a passus or pace of 4 feet 10.248 inches, the use of which word also survives. The Hebrews had the cubit, or length of forearm, equal to 19 inches, out of which arose the saying that nobody by taking thought can add a cubit to his stature. The Persians had a parasang—so often mentioned by Zenophon—of about $3\frac{1}{2}$ miles. Also there were currencies—the Hebrew shekel, the Roman libra (Italian lira), and denarius, which are recalled in the “L” and “d” of L.s.d.

If we consult books of reference, we learn in a few minutes about the astonishing multiplicity of weights, measures and currencies which, at this moment, are used by man in various regions of the world. The farsang of Abyssinia, the quo of Annam, the tarri of Algeria, hundreds of such unfamiliar names—overwhelm the imagination.

There have been many reformers of traditional weights, measures and currencies. Why—they ask—should children have to waste time at school, learning to transpose a given length, area, weight or sum of money from one scale of reckoning to another? Why should the necessity of such transposition complicate the conduct of commerce? Is it not absurd, that there should be 12 inches to the foot and 3 feet to the yard and 1760 yards to the mile and a different mile for the landsman and the seaman? Is it not ridiculous that $272\frac{1}{4}$ square feet should equal a square rod and that 160 square rods should equal an acre? Why should gold, silver and precious stones be appraised by Troy weight according to which 24 grains equal a pennyweight, and 20 pennyweights equal an ounce? Why should mariners have to remember that $7\frac{1}{2}$ cable lengths equal a mile and why should this nautical mile, supposed to be $\frac{1}{60}$ th of a degree at the Equator differ for Great Britain, the United States and France? Why should $21\frac{1}{2}$ quires of paper equal a printer's ream? And so with currencies. Why should four farthings make a penny and twelve pennies make a shilling and twenty shillings make a pound? Why should the value of the Indian rupee be a mysterious uncertainty on which economists themselves have to wrinkle their experienced brows?

Hence there has been devised and secured the wide adoption of a plan which is as masterly as it is simple and comprehensive. Are there not ten fingers and thumbs on our two hands and do not children count things on

their fingers? Why not express units of calculation in tens and multiples of ten—hundreds, thousands, millions—billions, trillions? And so with currency. Let there be 100 centimes to the franc, 100 cents to the dollar.

It was Jean Picard (1620-1682) who put forward the idea of using some natural standard of length as the basis of the decimal system. His publication was entitled *La Connaissance des Temps* and it was his idea that the swing of a pendulum in one second should furnish the unit of length. Out of Picard's initiative emerged what is called the metric system—named after the Greek word *metron*—which was established by revolutionary France—but only after prolonged calculation—in 1799. The fundamental unit is the metre representing one-ten millionth part of a quadrant of the earth through Paris. The unit of volume is a litre representing a cube with one-tenth of a metre for its edge. The unit of weight is a gram representing one-thousandth of a litre of water at a temperature of 4 degrees centigrade.

The metric system is thus the last word in Gallic logic. To the scientist and the statistician especially, its simplicities are invaluable. The acceptance of the Gregorian Calendar itself has been hardly more remarkable than the adoption of this far-reaching standardization of weights, and measures, whether associated or not with currencies. It is obligatory in Argentina, Austria, Hungary, Belgium, Brazil, Chile, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Peru, Portugal, Rumania, Yugo-Slavia, Spain, Sweden, Switzerland. Its use is legalized in Egypt, Britain, Japan, Russia, Turkey and the United States.

It will be noticed that nations regarded as rival—France and Germany—Italy and Yugo-Slavia—Russia and Japan—Chile and Peru—have no quarrel with what they know to be valuable as a standard of measurement. In a great human utility, there is found to be a denominator common to all races, religions and sovereignties.

We may ask why it is not possible to apply a decimal system to the calendar. There are exact multiples of length, volume and weight. Why cannot the calendar be thus neatly coordinated?

The clock that tells the time of day is a marvellous mechanism. But it is made by man. It can be changed by man. It can be broken by man. It can be mended by man. But the clock that tells the days, the months and the years is a celestial clock, created without man's assistance and maintained wholly beyond man's control. Not by the split of a second can man modify the music of the spheres. The celestial timepiece is a magnificent panorama of immutability.

Scientists who are competent to speak with authority on astro-physics seem to be in no doubt as to the origin, two thousand millions of years ago or thereabouts, of the solar system. There were two stars that passed one another at incredible speeds, mutually attracting their flaming vapors as

the sun and moon attract the tides of the ocean, and scattering fragments of fire, some of which, as the stars separated, went on whirling around the sun. The comets are nebulae that, as they sweep along their orbits, continue like torches to burn their way through space. The planets and their moons have solidified. Also there are specks of planetary dust that are sometimes caught by our atmosphere through which they penetrate at such speed that they are again rubbed by friction into flame. These are the shooting stars that occasionally reach the earth as meteorites. The solar system—antedating by billions of years the arrival of man—is a stupendous expression of titanic forces operating on matter, which have been gradually subjected to the reign of a divine law of orderly motion.

The early makers of the calendar had not arrived at any such conception of the universe above their heads. They had no means of knowing one resultant fact which to us is axiomatic. Celestial motions, thus attributable to shattering explosions and collisions in the heavens, must be chronologically independent. The spin of the earth on its axis is but slightly influenced by the rotation of the earth. And so with the rotation of the moon; it is but slightly influenced by the spin and rotation of the earth. It follows that there never has been and never will be an exact number of days in any lunar month or in any solar year, nor in the solar year is there any exact number of lunar months. At every point in their progress, makers of the calendar have thus had to deal, not merely with numerals, but with fractions which had to be incorporated into the almanac.

There is no difficulty in taking one astronomical unit—the day—and subdividing it into hours, minutes and seconds. Also, we can multiply the day into a week, so arriving at an exact table as follows:

60 seconds	one minute
60 minutes	one hour
24 hours	one day
7 days	one week

Nor would there be any difficulty, arithmetically, in changing this schedule—taking subdivisions at random—as follows:

80 seconds	one minute
70 minutes	one hour
30 hours	one day
10 days	one week

With the day as basis, it would thus be possible, theoretically, to ordain a decimal system for time, similar to the decimal system for weights, measures and coinage—in which case there would be 100 seconds to the minute, 100 minutes to the hour, ten hours to the day and ten days to the week. All of this is possible because we would be basing the entire structure of such measurement upon a simple astronomical unit—the day.

If, however, we tried to extend a decimal or any other such exactly

multiple calendar from a day to a month or a year, we would find at once that we had divorced the measurement of time from man's most familiar experiences—the lengths of light and darkness in the day, the tides, the appearance of the sky above his head, the seasons that are observed by the very soil under his feet, the habits of birds and beasts and fishes. The man who tried to use a decimal calendar would be more of an exile than a man without a country. He would be a man without a universe.

The development of the calendar as we know it today has been an age-long struggle for simplification of astronomical fractions. From the innumerable complications of the celestial mechanism, man has had to select the hands of his clock and, when selected, to adjust their relations.

The comets were of little value for this purpose. It was not until 1682 that Edmund Halley, the friend of Newton, observed the comet which is known by his name, calculated its orbit and predicted its return in 1757 after an interval of 75 years.

Attention—for instance, in pre-historic Mexico—was bestowed on the planets. But they were no more helpful than the comets. A year may be defined as the period within which a celestial body moves around the sun, and such “years” within the solar system are, approximately, as follows: Mercury, 88 days; Venus, $224\frac{3}{4}$ days; Earth, $365\frac{1}{4}$ days; Mars, 687 days; Jupiter, $4,332\frac{1}{2}$ days; Saturn, 10,759 days; Uranus, 30,687 days; Neptune, 60,127 days.

Such planetary periods—varying from three months to 164 years—could hardly be regarded as convenient as standards of time.

The calendar has thus depended in the main on three celestial bodies—the sun, the moon and the earth itself. The rotation of the earth around the sun gives the year, the rotation of the moon around the earth gives the month, and the spin of the earth on its axis gives the day.

OUT OF CHAOS

by JOSEPH GUINEY

Since first the vast machine began to move
 Each sun and planet in its charted site,
 The Earthsphere spun in its appointed groove,
 The Hands that built it, blessed it with His Light.
 So Time was measured by each rising sun
 Men scratched a cavern wall to mark each morn
 And scholars planned a clumsy chart to run
 Unceasingly. The calendar was born!
 Today our world creaks like an ancient van
 Archaic months encompass it so tight,
 But hope eternal springs for errant man
 A new plan breathes and lives by woman's sight.
 It guides our feet in even measured span
 And leads us from the darkness into LIGHT!

EXCERPTS AND REVIEWS

World Agreement

By WALTER F. WILLCOX

Professor of Economics at Cornell University,
Vice-Pres., International Statistical Institute
(*From an Address before the U. S. Govern-
ment's Central Statistical Board.*)

PUBLIC opinion — religious, scientific, technical and commercial—has moved rapidly since 1931 towards agreement on calendar reform of the 12-months, equal-quarter type.

The time has now come when the United States Government should propose the holding of an international congress on this subject, a meeting at which all nations and all interests should be fully represented, to consider what steps can be taken toward the enactment of a revised calendar.

American discussion of the whole question started fully ten years ago, with a campaign in favor of the 13-month year, led by George Eastman of Rochester. This phase of the discussion reached its peak about 1931, when 44 countries were represented at the calendar reform congress in Geneva. Two of the 44 countries definitely declared for the 13-month plan, and two voted with equal definiteness for the 12-month plan. The others were still non-committal.

Since 1931, however, much progress has been made. In the British House of Lords only three months ago, after a discussion in which Lord Desborough and the Archbishop of Canterbury advocated calendar reform, the government representative said: "If this matter were to be placed on the agenda of the forthcoming meeting of the League of Nations' Section on Communications and Transit, the whole question would have the most sympathetic consideration of the British representatives."

Germany seems to be equally favorable to calendar reform. Dr. Frick, Minister of Interior, said last June that his government was giving the subject much attention, although for the time being advocacy of the reform was being left to private and unofficial agencies. Many smaller powers, including all Latin-American countries, favor The World Calendar.

Of course, an important element in this

matter is the position of various religious bodies. The Roman Catholic Church holds that there is no dogmatic objection to a revision, but Rome is opposed to any 13-month calendar. Speaking for Protestantism, the Archbishop of Canterbury said in the House of Lords: "I have found it impossible to resist the plea for reform in this matter." Religious authorities at the Lambeth Conference saw no difficulty in principle to a change in the calendar; the Greek or Eastern Orthodox Church is a leader in the movement for revision.

The attitude of science seems to be stated with sufficient clarity in resolutions adopted by the American Philosophical Society, the American Academy of Arts and Sciences and the American Association for the Advancement of Science.

From the business point of view, the International Chamber of Commerce, the United States Chamber of Commerce, the London Chamber of Commerce, the Association of British Chambers, and the Chamber of Commerce of the State of New York are on record.

Labor representatives have spoken clearly through the International Labor Office, and quite recently through the Santiago Conference of American States.

British Commerce Speaks

(Abstracted from the London newspapers)

GENERAL reform of the calendar is advocated by the Council of the London Chamber of Commerce, in a resolution which has been sent to the Prime Minister, the Secretary of State for Home Affairs, and to His Holiness the Pope. A similar resolution has been passed by the Association of British Chambers of Commerce, on motion of Lord Desborough.

The Chambers are convinced that the fixing of the date of Easter, which would confer great benefits on trade and commerce generally, can best be made effective as part of a general calendar reform.

Inefficiency of the present system, it is pointed out, is obvious when it is realized that the same quarters are not comparable for statistical purposes from year to year

owing to the varying number and arrangement of working days.

The Government, therefore, is urged to use its influence at the conference to be held in the autumn under the auspices of the League of Nations to secure the adoption of a perpetual 12-month calendar divided into equal quarters of 91 days, with an undated Year End Day and a fixed date for Easter.

The present oscillating dates for Easter and Whitsun, Lord Desborough says, cause great inconvenience. There is needed one fixed Easter date for the whole of Christendom. A good deal of progress has been made of late toward this objective. When the League of Nations committee met in 1931, many schemes were submitted for the reform of the calendar, but they have now been reduced to two. Last year a distinguished Roman Catholic placed before the Pope the reasons for the reform, and the Roman Catholic Church is now watching the movement with the greatest interest.

Lord Desborough will represent the Association of British Chambers of Commerce at Geneva when the matter is next considered there.

Easter History

By WILLIAM H. BARTON, JR.

Lecturer at the Hayden Planetarium

(From the *Planetarium Bulletin*, N. Y. C.)

IN our modern world there are many reasons why it would be convenient to have the date of Easter fixed. Great Britain has already voted for a date independent of the moon. By act of Parliament in 1928, England approves an Easter falling on the first Sunday after the second Saturday in April.

The World Calendar Association, advocating The World Calendar, would fix the date absolutely on April 8.

If this calendar is adopted in 1939, as the Association confidently hopes, the Gregorian date of April 9 will become April 8 and remain there for all time and in all parts of the world.

The name Easter is derived from the Anglo-Saxon Goddess of Spring, Eostre, and a month in spring corresponding to our April was called Eosturmonath. In a great many languages we find the word

derived from the Hebrew name of the Passover festival, Pesach. The early Christians observed the Jewish festivals and the Passover became Easter to them. Their controversy over the date of Easter was finally settled at the Nicean Council called by Constantine in 325, and the rule now in use was adopted. Easter is the Sunday after the full moon that follows the Vernal Equinox. This brought uniformity to the observance, but still no good method of determining the paschal moon. The main difficulty lies in the fact that longitude enters the problem. The cycle now used involves the use of the Golden Number and Dominical Letter, mentioned in the almanacs and in the Book of Common Prayer. This artificial but ingenious method of finding the date of Easter was invented by Lilius.

From a Berlin Platform

By ERLAND ECHLIN

(Address at the University of Berlin)

CHANGES are going on all around us, in this modern world, that a few years ago would have been called impossible, perhaps even unnecessary. They indicate to us the adaptability of humanity, and the inevitability of evolution.

Another kind of a change, soon to materialize, is bigger in its field than any which we have seen, for the whole world will be affected by it. It is calendar reform.

Three years from now, in 1939, we shall probably find ourselves living under the new calendar. For the past century the growing agitation on the part of science, commerce and religion has developed until this change is approaching legislation.

In 24 of the world's leading nations, active committees and organizations are at work studying and publicizing the advantages of calendar reform. The League of Nations has long advocated it.

In a world torn by political disputations and the fear of war, the progress of this cause has passed without marked notice. Some statesmen still feel that "now is not the time" for it, but far more believe that calendar reform will prove an economic stabilizer with a tendency to promote international agreement, and that therefore now is the psychological moment to press for the adoption of the changes necessary to obtain these advantages.

CURRENT PRESS COMMENT

Change is Coming

Erie Times

The day is not far distant when all civilized countries will have a calendar which will meet the requirements of business men, schools and churches. But one thing is certain—it won't be a 13-month year.

Benefits Everybody

Lima (Peru) Cronica

South American countries are devoted partisans of calendar reform because it is a cause that benefits all. The proposed new calendar has many advantages. But not the fantastic 13-month plan. Rather the well-grounded proposal known as The World Calendar.

World Cooperation

Rio de Janeiro Correio da Manhã

In the cooperative international effort on behalf of calendar reform, we see a salutary indication of world progress and goodwill. The exigencies of modern life demand this change in time measurement. The movement for it transcends national barriers.

Concerted Action

Wooster (O.) Record

The world is awakening to the necessity of an improved system of reckoning time. The proposed new calendar is simple in structure, easily understood, workable. Several countries have already definitely committed themselves, and concerted action is expected this year toward inaugurating the revision in 1939.

No More Opposition

Gainesville (Mo.) Times

Most of the opposition to calendar reform has vanished, and the question now is which plan shall be adopted. At present

the 12-month equal-quarter proposal seems to be in the lead. Certainly something is going to happen in this matter.

Merits of Convenience

Jersey City Journal

Unquestionably the proposed World Calendar has many features to recommend it. And as it has been approved by business, science and the churches, with the League of Nations also behind it, there is strong probability of its adoption in 1939, when January 1 falls on Monday by the old calendar, in conformity with the proposed new one. It has all the merits of convenience.

United Support

Sheridan (Wyo.) Press

The Vatican has been examining the possibilities of calendar reform, and an announcement is made that the subject is under "constant consideration" at Rome. If the nations were to present the Holy See with a request, it is probable that the approach would be welcomed. But united support is needed.

Arguments in favor of calendar reform are simple. It goes without saying that a year of comparable quarters, months, weeks and days would be a boon to everybody. Any part of any year could be compared with any part of any other year, and that is something which cannot be done at present.

Official Interest

Washington Pathfinder

At last the time is ripe for a revision of the calendar. One of the most significant facts pointing toward this is that many government departments in Washington have taken up intensive study of the matter. And the government has indicated willingness to take part in international conferences on the subject. In case the 12-month World Calendar is chosen, the changes will be slight.

JOURNAL OF CALENDAR REFORM

EDITORS

CHARLES D. MORRIS

CHARLES C. SUTTER

Published by

The World Calendar Association, International Building, 630 Fifth Avenue
New York City

ELISABETH ACHELIS, *President*

VOL. VI

AUGUST, 1936

No. 2

CHURCHES of America registered themselves more strongly than ever before, on the subject of calendar reform, at the spring meeting of the American Section of the Universal Christian Council. The attitude of the churches has been made clear to the United States government in a letter addressed to the President and the Secretary of State by a special committee, consisting of Dr. S. Parkes Cadman, Dr. Samuel McCrea Cavert and Dr. Henry Smith Leiper. The letter, after stating the connection of the American churches with the research studies which have been made, and the overwhelmingly favorable opinions rendered by the various denominational bodies, says:

"The Universal Christian Council, as the most highly representative coordinating authority among all the non-Roman churches, has been engaged in a formal study of calendar reform for the past four years. The undersigned have been appointed by the American Section to make this formal report to the American government stating the favorable attitude of our churches toward the international proposals for reform of the calendar." From the context it is clear that the form of calendar favored is The World Calendar Association's 12-month plan.

A further part of the report, which constitutes a section of the Minutes of the meeting of the American Section, states: "The calendar has a religious meaning, and a revised calendar will inevitably have an effect in unifying and stabilizing church calendars of all the great communions. The significance of the movement, in its bearing on church unity, is what has won for it the attention and support of church leaders."

The action of the Church of England, and in particular the address of the Archbishop of Canterbury in the House of Lords, has been noted in this country by church leaders and the prevailing view seems to be that all significant obstacles have been removed and any action which the nations see fit to take in the direction of adopting the 12-month revision will be accepted and approved by the majority of all church bodies.

FROM THE MAIL BAG

I shall be glad to support action regarding calendar simplification.—Max Mason, Pres., The Rockefeller Foundation, N. Y.

You are making splendid progress. This will be welcome news to our businessmen. Is there anything we can do to aid in speeding up this good cause?—William H. Zeller, Secretary, Manchester Chamber of Commerce, New Hampshire.

I have been thoroughly acquainted with the high value of your Association's well thought out calendar, and I have sought to bring about its acceptance in the circles in which I may have some influence.—Dr. Walter Simons, Chief Justice of Germany, Berlin.

We are re-submitting The World Calendar plan to our Retail Trades Association for its reaction.—G. P. Backman, Secretary, The Chamber of Commerce and Commercial Club, Salt Lake City, Utah.

I am much interested in the work the Association is doing.—A. M. Damon, Commander, Salvation Army, Atlanta, Ga.

Now is the time to "modernize" our calendar. I favor the 12-month, equal-quarter plan because of its practicability.—G. W. Anthony, Burlington, N. C.

I am very much interested in the possibilities of calendar reform.—Mrs. R. C. Hayden, Principal, Floral Park, N. Y.

We favor the 12-month calendar (World Calendar).—E. C. Logan, Lions Club, Correctionville, Iowa.

I am very much interested.—J. C. Armstrong, Professor, St. Bonaventure Univ., Olean, N. Y.

Heartily in sympathy with the project which you have under way. The articles on the calendar by so distinguished men are very valuable and should be in the hands of high school students and high school teachers, especially of history, geography and general science.—D. W. Morehouse, Pres., Drake Univ., Des Moines, Iowa.

I am strong for The World Calendar.—J. L. Summers, Treasury Department, Washington, D. C.

At this time the major problem in calendar reform is apparently no longer that of constructing an accurate and convenient calendar, but is that of overcoming inertia against change from our present defective system. The World Calendar of 12 months will encounter less difficulty in this respect than would the 13-months proposal, and its intrinsic advantages are such as to call for its universal adoption.—Dr. Calvin B. Bridges, Carnegie Institution, Washington, D. C.

I shall be glad to do anything I can to promote the adoption of such a change, which seems to me to be desirable from every possible point of view.—F. W. Johnson, Pres., Colby College, Waterville, Maine.

Your articles are wonderfully interesting and instructive. I should miss the magazine greatly.—R. E. Hartsock, Prof., Stillwater, Okla.

I think stabilized Easter and Calendar Reform a fine thing.—A. Shiland, Lawyer, New York.

Wish articles could be brought to attention of all college and high school students.—R. D. Smith, Railway Official, Corbin, Ky.

I wish every success to The World Calendar in its efforts to make it prevail.—W. A. Neilson, President, Smith College, Northampton, Mass.

We are enthusiastic in our approval of the paper on Calendar Reform and Education. We are cooperating energetically in efforts to get thoughtful people, especially in the schools, to consider the desirability of calendar reform and to persuade them that the "World Calendar" offers the best reform.—E. C. Coker, Prof. Astronomy and Mathematics, Univ. of South Carolina, Columbia, S. C.

From practical business considerations, we favor a revised calendar—but on the 12-month basis.—Charles H. Watts, Pres., Beneficial Management Corp., New York.

You are working in right direction.—C. F. Heath, Public Accountant, Burlington, Vt.

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CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comité Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

COLOMBIA: Comité Colombiano del Calendario Mundial, Dr. Eduardo Posada, Chairman, Consulado General de Honduras, Apartado 42, Bogota.

COSTA RICA: Comité Costarricense del Calendario Mundial (Igualmente de Guatemala, Honduras, San Salvador y Nicaragua), Don Teodoro Picado, Chairman, Ministro de Educacion Publica, San Jose.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38 Parliament Street, London.

FRANCE: Bureau d'Etudes pour la Reforme du Calendrier, Paul Louis Hervier, Secy., 5 Rue Bernoulli, Paris.

GERMANY: German National Committee on Calendar Reform, Ministry of the Interior, Berlin—Der Weltbund fur Kalenderreform, Dr. Rudolph Blochmann, Secy., 24 Losenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform, Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRISH FREE STATE: Committee for Calendar Reform, E. K. Eason, Secy., 80 Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comité Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comité Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, Panama.

PERU: Comité Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comité Latino-Americano del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatory, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., 4 Jenatschstrasse, Zurich.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Apt. 3, Istanbul.

URUGUAY: Comité Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, Calle Sierra 2268, Montevideo.

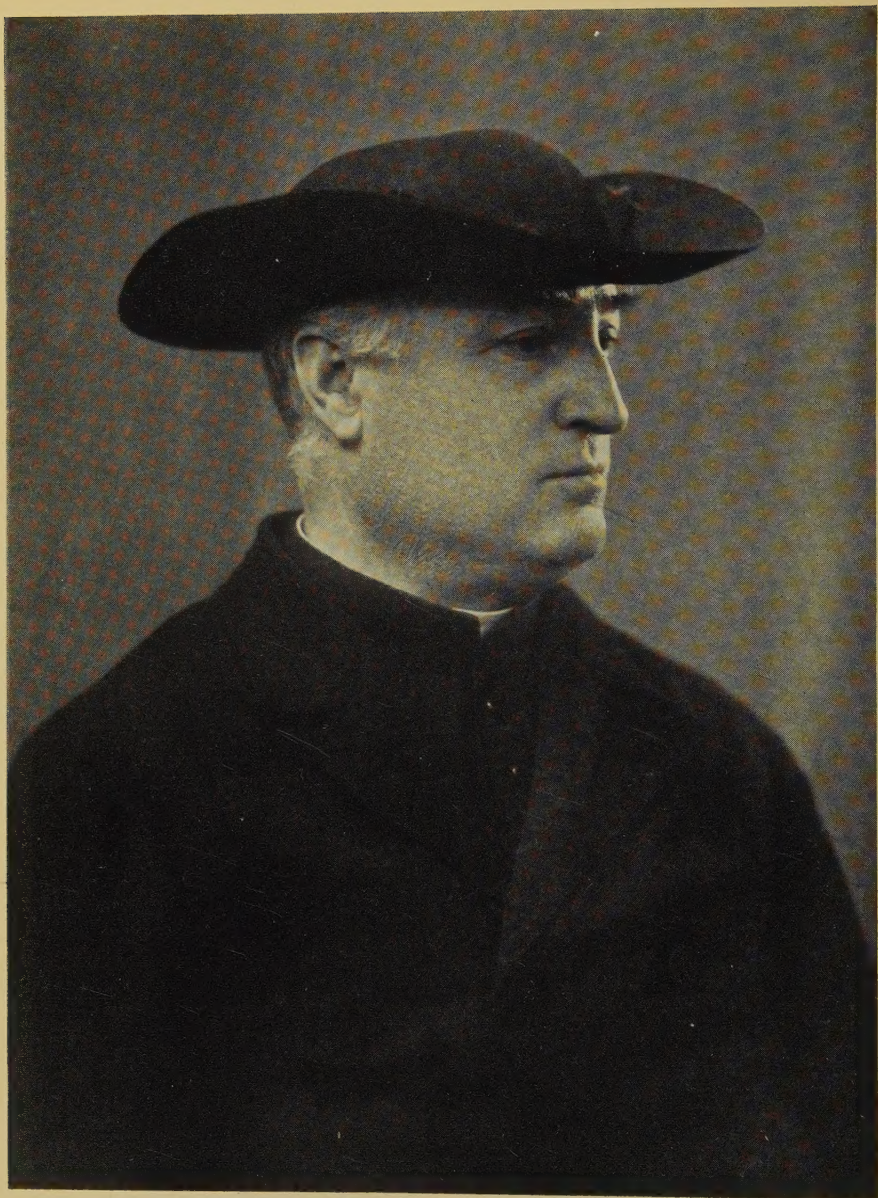
ABBÉ CHAUVE-BERTRAND'S BOOK

ABBÉ CHAUVE-BERTRAND, of Nevers, France, is the author of a book which has just appeared in France, under the title "La Question de Paques et du Calendrier." M. Paul-Louis Hervier, well-known French journalist and literary critic, calls it "the completest and most scholarly treatment of its subject which has ever appeared in the French language." Dr. Edward S. Schwegler, American authority on calendar reform, says it is "without doubt the most satisfactory and complete work of its kind in any language." Mr. P. W. Wilson, book reviewer of the *New York Times* regrets "that the volume is not available in more languages than one, for a translation into English would be of great value."

Abbé Chauve-Bertrand has been a student and advocate of calendar reform for more than 25 years. He has written copiously for Catholic magazines and reviews on the subject, and was a Roman Catholic delegate to the international conference on the subject—the Liège Congress of 1914.

The Abbé was the secretary of the International Astronomical Union's Committee on Calendar Reform, and prepared the Committee's 1922 report, which was the basis on which the League of Nations first took up the subject of calendar revision.

A limited supply of the Abbé's book has been imported by the Journal of Calendar Reform for its readers, and these copies are available at a price of \$1 each, postpaid.



ABBE CHAUVE-BERTRAND

Celebrated Roman Catholic authority, whose book on calendar reform has just been
published in Paris
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